09/533.556   ORDER by Eleanor

BLAKELY
SOKOLOFF
TAYLOR &
ZAFMAN
A LIMITED LIABILITY
PARTNERSHIP INCLUDING
LAW CORPORATIONS

1279 OAKMEAD PARKWAY

SUNNYVALE, CALIFORNIA 94085

(408) 720-8300 (Telephone)

(408) 720-8383 (Facsimile)

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Fax Number: 703-305-9822   Telephone No.:

From: Jordan M. Becker

Date: 3/13/2003   Time:

Operator: Julie Arango   Matter: 3399P087C

Number of pages including cover sheet: 11

In Re Patent Application of: Peter F. King et al.

Application No.:   09/533,556

Filed: February 24, 1999

For: Providing a Directory of Frequently Used Hyperlinks on a Remote Server

Enclosed are the following documents:

Courtesy Copies of:

[X] returned stamped postcard dated February 28, 2002 (1 pg.)

[X] Power of Attorney by Assignee and Revocation of Previous Powers (2 pgs.)

[X] returned stamped postcard dated January 7, 2002 (1 pg.)

[X] Request for Filing Receipt (2 pgs.)

[X] copy of Decision Granting Petition (1 pg.)

[X] Change of Correspondence Address (1 pg.)

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CONFIDENTIALITY NOTE

(Rev. 11/23/97)

Attorney Docket No.: 3399P087C   <u>Patent</u>

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application for:

    Peter F. King et al.   Examiner: Not yet assigned

Serial No.: 09/533,556   Group Art Unit: 2776

Filing Date: February 24, 1999

For: PROVIDING A DIRECTORY OF
     FREQUENTLY USED HYPERLINKS
     ON A REMOTE SERVER

which is a continuation of:

Serial No.: 08/996,379

Filing Date: December 22, 1997

which issued as U.S. Patent No.: 5,895,471

Assistant Commissioner for Patents
Washington, D.C. 20231

<u>REQUEST FOR FILING RECEIPT</u>

Sir:

    Applicant respectfully requests a filing receipt for the above-referenced

patent application.

    The above-referenced application was filed on February 24, 1999. To date,

the applicant has not received an official filing receipt.

    In support of this Request for Filing receipt, attached please find a copy of

the Decision Granting Petition.

    In view of the information presented, Applicant hereby respectfully

requests the filing receipt for the above-referenced application.

1

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP

ORIGINAL SIGNED BY

Dated: __12\10__, 2001   ~~JMB~~

Jordan ~~M. Bucker~~
Registration No. 39,602

Customer No. 26529
12400 Wilshire Boulevard
Seventh Floor
Los Angeles, CA 90025-1026
(408) 720-8300

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December 10, 2001
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Julie Arango
          (Typed or printed name of person mailing correspondence)

          12/10/01
          (Signature of person mailing correspondence)

2

Attorney Docket No.: 3399P087C   <u>Patent</u>

<div align="center">

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
</div>

In re Patent Application for:

    Peter F. King et al.   Examiner: Not yet assigned

Serial No.: 09/533,556   Group Art Unit: 2776

Filing Date: February 24, 1999

For: PROVIDING A DIRECTORY OF
       FREQUENTLY USED HYPERLINKS
       ON A REMOTE SERVER

which is a continuation of:

Serial No.: 08/996,379

Filing Date: December 22, 1997

which issued as U.S. Patent No.: 5,895,471

Assistant Commissioner for Patents
Washington, D.C. 20231

<div align="center">

<u>REQUEST FOR CHANGE OF ATTORNEY DOCKET NUMBER</u>
</div>

Sir:

    To assist in the management of this case, Applicant requests a change of

attorney docket number for the above-referenced patent application. Please

change:

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From:

UP-1007C1

To:

3399P087C
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Please correct your records to reflect the above information.

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1
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No fee is believed to be due. However, if the PTO believes otherwise please charge deposit account 02-2666 any additional charges that may be due. If you have any questions please contact the undersigned.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP

ORIGINAL SIGNED BY

JMB

Dated: 12/10, 2001

Jordan M. Becker
Reg. No. 39,602

Customer No. 26529
12400 Wilshire Blvd.
Seventh Floor
Los Angeles, CA 90025-1030
(408) 720-8300

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Name of Person Mailing Correspondence

Julie Arango   12/10/01
          Signature   Date

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TRANSMITTAL FORM *(to be used for all correspondence after initial filing)*	**Application Number** — 09/533,556
	Filing Date — February 24, 1999
	First Named Inventor — KING
	Group Art Unit — 2776
	Examiner Name — To be assigned

Total Number of Pages in This Submission	2	Attorney Docket Number	UP-1007C1

ENCLOSURES *(check all that apply)*

☐ Fee Transmittal Form
   ☐ Fee Attached
☐ Amendment / Response
   ☐ After Final
   ☐ Affidavits/declaration(s)
☐ Extension of Time Request
☐ Express Abandonment Request
☐ Information Disclosure Statement
☐ Certified Copy of Priority Document(s)
☐ Response to Missing Parts/ Incomplete Application
   ☐ Response to Missing Parts under 37 CFR 1.52 or 1.53

☐ Assignment Papers (for an Application)
☐ Drawing(s)
☐ Licensing-related Papers
☐ Petition Routing Slip (PTO/SB/69) and Accompanying Petition
☐ Petition to Convert to a Provisional Application
☐ Power of Attorney, Revocation Change of Correspondence Address
☐ Terminal Disclaimer
☐ Small Entity Statement
☐ Request for Refund

Remarks

☐ After Allowance Communication to Group
☐ Appeal Communication to Board of Appeals and Interferences
☐ Appeal Communication to Group (Appeal Notice, Brief, Reply Brief)
☐ Proprietary Information
☒ Status Letter
☐ Additional Enclosure(s) (please identify below)

1. Return postcard.

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm or Individual name	Alan D. Minsk
Signature	*[signature]*
Date	Sept. 25, 2000

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Typed or printed name	Vicki Lorist		
Signature		Date	09/25/00

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s):	Peter F. King and Bruce V. Schwartz
Title:	Providing a Directory of Frequently Used Hyperlinks on a Remote Server
Serial No.:	09/533,556
Filing Date:	02/24/99
Examiner:	N/A
Group Art Unit:	2776
Docket No,:	UP1007Ct

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September 21, 2000

Assistant Commissioner for Patents

Washington, DC 20231

Request for Status

Dear Sir:

The Applicants respectfully request the updated status of the above identified application filed on 02/24/99, subsequently with a petition to correct an application transmittal.

Please telephone the undersigned at (408)777-8873, if there are any questions.

Dated this 22nd day of September, 2000

Joe Zheng
Reg. No.:39,450

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TRANSMITTAL FORM	Application Number	09/533,556
	Filing Date	February 24, 1999
	First Named Inventor	KING
(to be used for all correspondence after initial filing)	Group Art Unit	2776
	Examiner Name	To be assigned
Total Number of Pages in This Submission 3	Attorney Docket Number	UP-1007C1

ENCLOSURES   (check all that apply)

☐ Fee Transmittal Form	☐ Assignment Papers (for an Application)	☐ After Allowance Communication to Group
☐ Fee Attached	☐ Drawing(s)	☐ Appeal Communication to Board of Appeals and Interferences
☒ Amendment / Response	☐ Licensing-related Papers	☐ Appeal Communication to Group (Appeal Notice, Brief, Reply Brief)
☐ After Final	☐ Petition Routing Slip (PTO/SB/69) and Accompanying Petition	☐ Proprietary Information
☐ Affidavits/declaration(s)	☐ Petition to Convert to a Provisional Application	☐ Status Letter
☐ Extension of Time Request	☐ Power of Attorney, Revocation Change of Correspondence Address	☐ Additional Enclosure(s) (please identify below)
☐ Express Abandonment Request	☐ Terminal Disclaimer	1. Return postcard.
☐ Information Disclosure Statement	☐ Small Entity Statement	
☐ Certified Copy of Priority Document(s)	☐ Request for Refund	
☐ Response to Missing Parts/ Incomplete Application	Remarks	
☐ Response to Missing Parts under 37 CFR 1.52 or 1.53		

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm or Individual name	Alan D. Minsk
Signature	*[signature]*
Date	Sept. 25, 2000

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s):	Peter F. King and Bruce V. Schwartz
Title:	Providing a Directory of Frequently Used Hyperlinks on a Remote Server
Serial No.:	09/533,556
Filing Date:	02/24/99
Examiner:	N/A
Group Art Unit:	2776
Docket No,:	UP1007Ct

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September 21, 2000

Assistant Commissioner for Patents

Washington, DC 20231

Amendment of Preliminary Amendment

Dear Sir:

Please amend the Preliminary Amendment for the above-referenced patent application as follows:

On the 1st page of the Preliminary Amendment

Please delete the paragraph "

In the specification

On page 1, please replace "This application claims the benefit of priority of U.S. provisional application number 60/052,394 filed July 11, 1997." with --The

-1-

present application is a continuation application of US Patent application ("Parent Application"), Serial No.: 08/996,379, filed on, Dec. 22, 1997, Docket No. UWP002. entitled " Providing a Directory of Frequently Used Hyperlinks on a Remote Server", assigned to Unwired Planet, Inc. which is also the assignee of the present application.--

"

and replace with the following paragraph --

In the specification

On page 1, please replace "This application claims the benefit of priority of U.S. provisional application number 60/052,394 filed July 11, 1997." with --The present application is a continuation of US Patent application, Serial No.: 08/996,379, now US Patent No. 5,895,471, entitled " Providing a Directory of Frequently Used Hyperlinks on a Remote Server", assigned to Phone.com, Inc. which is also the assignee of the present application. --

Remarks

The applicants respectfully request the above updated information be entered in the pending application. For the convenience of the examiner, a copy of the earlier-filed preliminary amendment is enclosed herewith.

Please telephone the undersigned at (408)777-8873, if there are any questions.

Dated this 22nd day of September, 2000

Joe Zheng
Reg. No.:39,450

-2-

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/꒷ꐏ꒐꒐

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s):	Peter F. King and Bruce V. Schwartz
Title:	Providing a Directory of Frequently Used Hyperlinks on a Remote Server
Serial No.:	N/A
Filing Date:	Herewith
Examiner:	N/A
Group Art Unit:	N/A
Docket No.:	UWP002/1007Ct

February 23, 1999

Assistant Commissioner for Patents

Washington, DC 20231

Preliminary Amendment

Dear Sir:

Please amend the above-referenced patent application as follows:
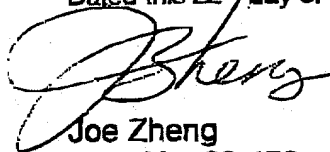
In the specification

On page 1, please replace "This application claims the benefit of priority of U.S. provisional application number 60/052,394 filed July 11, 1997." with --The present application is a continuation application of US Patent application ("Parent Application"), Serial No.: 08/996,379, filed on, Dec. 22, 1997, Docket No. UWP002. entitled " Providing a Directory of Frequently Used Hyperlinks on a Remote Server", assigned to Unwired Planet, Inc. which is also the assignee of the present application.--

In the claims

Please delete Claims 1-18.

-1-

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Please add Claims 19-39 as follows:

19. A method for a client managing a directory in a remote server; said method comprising:

    receiving, in said client, a unit of information from a network, said unit of information having an identifier;

    receiving an input from a user interface of said client, said input corresponding to said identifier;

    generating a request in response to said input; said request comprising said identifier; and

    sending said request to said remote server to cause said directory to be updated with respect to said request.

20. The method as recited in claim 19; wherein said user interface comprises keys that can be activated by a user to convey said input therefrom.

21. The method as recited in claim 20; wherein said identifier comprises a Uniform Resource Locator (URL).

22. The method as recited in claim 19; wherein said client is a portable electronic device having a capability of networking with said network.

23. The method as recited in claim 22; wherein said network comprises a wireless network.

24. The method as recited in claim 23; wherein said client is selected from a group consisting of a telephone, a portable computing device and a personal data assistant.

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25. The method as recited in claim 19; wherein said request is an add request, said directory is updated by adding said identifier to said directory in said remote server.

26. The method as recited in claim 19; wherein said request is a delete request, said directory is updated by deleting said identifier from said directory in said remote server.

27. A method for a client managing a directory in a remote server; said method comprising:

   receiving, in said client, a unit of information from a network, said unit of information comprising a list of items, each corresponding to an identifier identifying a resource in said network, said identifiers maintained in said directory in said remote server;

   receiving an input from a user interface of said client, said input corresponding to one of said items;

   generating a request in response to said input; said request comprising a parameter with respect to said one of said items; said parameter indicating a desired resource and said request subsequently sent to said remote server;

   receiving a reply message to said request from said remote server, wherein said reply message comprises a reference identifier retrieved from said directory in response to said parameter in said request; and

   receiving said desired resource from said network; said resource identified by said reference identifier.

28. The method as recited in claim 27; wherein said network comprises a wireless network.

29. The method as recited in claim 28; wherein said reference identifier comprises a Uniform Resource Locator (URL).

-3-

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30. A method for a client managing a directory in a remote server; said method comprising:

    receiving, in said remote server, a request from said client; said request comprising an identifier identifying a resource in a network and to cause said directory in said remote server to be updated; wherein said resource has been received in said client and said request is generated in said client with respect to said resource; and

    updating said directory in response to said request when it is determined that said client is authorized to access said directory.

31. The method as recited in claim 30, wherein said client is a portable electronic device having a capability of networking with said network.

32. The system as recited in claim 31; wherein said network comprises a wireless network.

33. The system as recited in claim 32; wherein said client is selected from a group consisting of a telephone, a portable computing device and a personal data assistant.

34. The method as recited in claim 30; wherein said updating said directory comprises:

    deleting an entry from said directory when said request is a delete request; wherein said entry comprises a reference identifier identical to said identifier.

35. The method as recited in claim 30; wherein said updating said directory comprises:

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adding an entry to said directory when said request is an add request;

wherein said entry comprises said identifier that is not identical to any

reference identifiers in said directory.

36. The method as recited in claim 30; wherein, when said request is an add request, said updating said directory comprises:

deleting an entry from said directory, said entry comprising a reference identifier identical to said identifier;

adding a new entry to said directory, said new entry comprising said identifier.

37. A method for a client managing a directory in a remote server; said method comprising:

receiving, in said remote server, a request from said client; said request comprising an identifier identifying a resource in a network;

looking up in said directory to determine if there is a reference identifier corresponding to said identifier;

generating, in said remote server, a reply message including said reference identifier; and

sending said reply message from said remote server to said client, wherein said client receives said resource according to said reference identifier in said reply message.

38. The method as recited in claim 37, wherein said network comprises a wireless network.

39. The method as recited in claim 38, wherein said client is a mobile device having a capability of networking with said network and selected from a group consisting of a telephone, a portable computing device and a personal data assistant.

-5-

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Remarks

Claims 1-18 are deleted. Claims 19-39 are newly presented for examination and are believed patentable over the prior art of record.

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Name *ELAINE KRAMER-ADAMS*

Signed *Elaine Kramer-Adams*

Dated this 24rd day of February, 1999

Zheng

Joe Zheng
Reg. No.: 39,450

-6-

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
APPLICATION FOR UNITED STATES PATENT

Providing a Directory of Frequently Used Hyperlinks
on a Remote Server

Inventors: Peter F. King
             Bruce V. Schwartz

CROSS-REFERENCE TO A RELATED APPLICATION

This application claims the benefit of priority of U.S. provisional application number 60/052,394 filed July 11, 1997.

MICROFICHE APPENDIX

A listing of particular embodiments of computer programs incorporating features of the present invention is provided in a microfiche appendix to this disclosure and is incorporated herein by reference. This appendix consists of 17 microfiche having a total of 1641 frames.

AUTHORIZATION WITH RESPECT TO COPYRIGHTS

A portion of the disclosure of this patent document, including but not limited to the microfiche appendix, contains material which is subject to copyright protection. The copyright owner has no objection to the facsimile reproduction by anyone of the patent document or the patent disclosure, as it appears in the Patent and Trademark Office patent file or records, but otherwise reserves all copyright rights whatsoever.

TECHNICAL FIELD

The present invention relates generally to devices and methods for interacting with hypermedia servers connected to networks. More particularly, the present invention pertains to structures and methods of system interactions arranged such that practical access to hypermedia servers is available to a wider range of devices such as wireless telephones.

BACKGROUND ART

Although networks like the Internet have been in existence for years, they have not been a popular medium of information exchange until very recently. The recent explosive growth in usage of the Internet, for example, is due in large part to the development of devices and methods that

simplify the actions a user must take to access multimedia information stored by network servers. One significant development is the use of hyperlinks which allows disparate pieces of information to be organized in nonsequential ways and which allows a user to easily navigate among the linked information. By assigning a unique identifier to each distinct piece of multimedia information

5   available throughout a network, information can be readily accessed without regard to where it is stored. Network clients and servers participating in such a "hypermedia" network are referred to herein as hypermedia clients and hypermedia servers, respectively.

The Hypertext Transfer Protocol (HTTP) is one example of a method that implements hyperlinks and is probably the most widely used method for accessing the Internet today. A unique

10   identifier, known as a Uniform Resource Locator (URL), specifies the location of a resource that can be accessed from the network.

HTTP clients and HTTP servers typically communicate with one another using any one of a family of communication protocols known collectively as Transmission Control Protocol / Internet Protocol (TCP/IP). One commonly used member of the family, known as Transmission Control

15   Protocol (TCP), provides for a very reliable delivery of an information stream. According to the TCP, a sender establishes a "connection" with a receiver, transmits an information stream in basic units known as packets, and retransmits any packets that are either lost or corrupted during transmission. One advantage of the TCP is that it guarantees the receiver will receive the bits and bytes in the information stream in the correct order. Unfortunately, the TCP requires considerable

20   computing and network bandwidth resources. The establishment of a connection, for example, may require an exchange of more than ten packets between sender and receiver.

In addition to the resources required to implement the TCP, the HTTP itself also requires considerable resources to format, process and display information. This is not a significant disadvantage in many situations because personal computers and other workstations with sufficient

25   computing power, memory and display capabilities are readily available to implement the HTTP client function.

There is, however, a growing interest to provide access to hypermedia servers connected to networks such as the Internet through mobile devices, particularly handheld devices like wireless telephones. These devices are characterized by severe limitations in processing power, memory

30   space, display size, and buttons or keys by which a user can request, view and manipulate information obtained from a hypermedia server. Furthermore, the bandwidth of the communication channels connecting the mobile devices to the rest of the network is also severely limited.

A wireless telephone has only a small fraction of the resources provided by a typical desktop or portable computer. Typically, the processing power is less than one percent of the processing power in many computers, the memory space is generally much less than 150 kilobytes (kB), and the display is perhaps four lines high and twelve or twenty characters wide. Graphics capabilities

5   are very limited or nonexistent. The communication path is often in the range of 400 to 19,200 bits per sec. and the cost using that communication path is measured in terms of United States dollars per 100 kB or more.

Attempts to implement HTTP client functions in portable devices have not been very successful. Attempts that have used mobile devices providing facilities which are comparable to

10   conventional computers are unattractive because the cost of the device is very high. Other attempts using less expensive devices are also unattractive because the client functions are severely limited. In either case, the communication delays and costs in exchanging packets with the network just to establish a connection, for example, are intolerable. The delays are particularly annoying in situations where a user is notified that electronic mail or other information has been received in the

15   user's "mail box" somewhere on the network and the user must wait during the roundtrip delay required to request and receive that mail from the mail box. The usability of the device is further impaired because there is insufficient memory space to store lists of frequently used hyperlinks. For HTTP clients, these hyperlink identifiers are URLs that are often difficult to remember and difficult to enter into the device due to limited data entry capabilities. Two popular software products used in

20   conventional computers refer to these stored hyperlinks as "bookmarks" and "favorites."

DISCLOSURE OF INVENTION

It is an object of the present invention to provide structures and methods required by devices to interact with hypermedia servers connected to networks so that practical access to such servers is

25   available to a wider range of devices such as wireless telephones.

According to the teachings of the present invention in one embodiment of a system that comprises a remote device coupled to a directory server, the remote device is remotely located with respect to the directory server, comprises first storage, a display and a button, and executes a first program that causes the remote device to receive a unit of information from a hypermedia network,

30   the unit of information having an identifier, and to present on the display a representation of the unit of information, to receive an input signal in response to the button being activated and, in response, to send an add request to the directory server that conveys the identifier, and the directory server

UWP002   - 3 -

comprises second storage that stores a directory associated with the remote device and executes a second program that causes the directory server to receive the add request and, in response, to add an entry to the directory representing the identifier.

The various features of the present invention and its preferred embodiments may be better

5 understood by referring to the following discussion and the accompanying drawing. The contents of the following discussion and the drawing are set forth as examples only and should not be understood to represent limitations upon the scope of the present invention.

BRIEF DESCRIPTION OF DRAWING

10 The Figure illustrates in schematic form the major components of a system in which a device such as a wireless telephone can access the resources provided by a hypermedia server connected to a network.

MODES FOR CARRYING OUT THE INVENTION

Overview

15 The Figure illustrates a system in which various aspects of the present invention may be practiced. As will be explained below, some of the components illustrated in the Figure may be omitted in various embodiments. As shown, client 1 uses network 40 to access resources provided by server 51 and server 52. Although it is contemplated that server 51 and server 52 are hypermedia

20 servers, perhaps operating in conformity with the Hypertext Transfer Protocol (HTTP), this is not necessary to practice the present invention.

Client 1 comprises computer 31 and device 11, which is remotely located with respect to computer 31. Remote device 11 and computer 31 perform functions that implement client 1. Remote device 11 provides a user interface through which information can be presented to a user

25 and input can be received from a user. Computer 31 exchanges information with network 40 in a manner that is consistent with a conventional network client.

Computer 31 stores parameters and information in storage 32 that typically is a combination of random access memory (RAM), read-only memory (ROM) and long-term storage devices such as magnetic and optical disk drives. Computer 31 communicates with remote device 11 through

30 receiver 21 and transmitter 22. Information that is sent by computer 31 through transmitter 22 is received by remote device 11 through receiver 16. Information that is sent by remote device 11 through transmitter 15 is received by computer 31 through receiver 21.

In the embodiment shown in the Figure, remote device 11 comprises display 12, one or more buttons 13, storage 14, transmitter 15 and receiver 16. For example, device 11 may be a wireless telephone such as a MobileAccess™ telephone by Mitsubishi Wireless Communications, Inc., or a Duette telephone by Samsung Electronics Corporation. In typical wireless telephones, the

5   display 12 is a liquid crystal display (LCD) panel. Buttons 13 represent one or more data entry devices such as switches, keys or buttons. Storage 14 represents memory circuits or other devices that are capable of storing digital information. Preferably, at least part of storage 14 is persistent storage, meaning that information is retained when device 11 is turned off. In some embodiments, a portion of storage 14 is organized into a unified push/pull cache. It is also contemplated that a

10   portion of storage 14 will store program instructions, either in persistent memory or in ROM, and that device 11 will comprise a microprocessor or other type of processing circuitry capable of executing the program instructions.

        The nature of the communication paths shown between computer 31, server 51 server 52, receiver 21 and transmitter 22 are not critical to the practice of the present invention. Such paths

15   may be implemented as switched and/or non-switched paths using private and/or public facilities. Similarly, the topology of network 40 is not critical and may be implemented in a variety of ways including hierarchical and peer-to-peer networks. Computer 31 and server 51, for example, may be locally located with respect to one another and may be implemented on the same hardware.

        In concept, the nature of the communication paths between computer 31 and device 11 is

20   also not critical to the practice of the present invention; however, in many applications device 11 is a wireless device that uses a communication technology such as electro-magnetic transmission in the radio-frequency to infrared portions of the spectrum. In applications where device 11 is a wireless telephone, a cellular telephone for example, transmitter 15, receiver 16, receiver 21 and transmitter 22 represent communication facilities used for normal telephone calls.

25   Examples of devices and methods that may be used to practice various aspects of the present invention are discussed below. The following discussion describes variations of a preferred embodiment that implements client 1 according to the HTTP; however, it should be understood that the present invention is not so limited.

Remote Device

30   In applications where client 1 is implemented as a HTTP client, device 11 provides at least three basic functions. A navigation function allows a user to navigate or traverse HTTP Uniform Resource Locator (URL) hyperlinks. A communication function exchanges information with

computer 31. An interface function provides a user interface through which information may be presented to the user and through which input may be received from the user.

Preferably, these functions are implemented by a software-controlled process using an event-driven architecture. Events may be initiated by a user through buttons 13, for example, or may be initiated by signals received through receiver 16. The navigation function operates in either of two states. In the "ready" state the device awaits user input specifying a hyperlink to traverse. In the "pending" state the communication function has submitted a request to computer 31 and the device is waiting for a reply from computer 31. In terms of the HTTP, the ready state waits for user input specifying the URL of a hypermedia entity to display or process and the pending state waits for computer 31 to provide a requested hypermedia entity.

In one embodiment, hypermedia information is exchanged with computer 31 according to the Handheld Device Transfer Protocol (HDTP). A specification for a version of this protocol, sometimes referred to as Secure UPLink Gateway Protocol (SUGP), is provided in an Annex. The HDTP resembles the HTTP but is optimized for use with remote devices like wireless telephones and preferably is conveyed using the User Datagram Protocol/IP (UDP/IP). The UDP/IP is generally regarded as being less reliable than TCP/IP, for example, because it does not guarantee that packets will be received, nor does it guarantee that packets will be received in the same order that they are sent. Datagram protocols like the UDP/IP are attractive in practicing the present invention, however, because it does not require a "connection" to be established between a sender and a receiver before information can be exchanged. This eliminates the need to exchange a large number of packets during session creation.

In a preferred embodiment, hypermedia information is organized according to a Handheld Device Markup Language (HDML) into cards and decks. Multiple decks and other types of message entities can be organized into information structures called digests. A specification for a version of HDML is provided in the Annex.

A "deck" is the smallest unit of HDML information that can be exchanged with computer 31. Each deck has a unique identifier or URL. A user may navigate from one deck to another by traversing hyperlinks that reference the desired deck. If remote device 11 has a cache for received decks, the device first consults the cache to determine if the requested deck is available. Remote device 11 may also be implemented to determine if a desired deck found in cache is also current, that is, not out of date. If so, that deck is accessed without requiring any communication with

computer 31. If the requested deck is not in the cache or is out of date, however, a request for that deck is sent to computer 31. This is discussed in more detail below.

Because the display on remote device may be too small to show all the information in a deck at one time, each deck may be organized into one or more cards. A "card" is a unit of information

5   that can be displayed and/or can define how a user may interact with the device.

There are several types of cards. A "display" card conveys information that is to be displayed. An "entry" card conveys a method that permits a user to enter information and typically also conveys information to display. A "choice" card presents alternatives for selection by a user. Entry and choice cards also convey methods to be performed by device 11 that carry out functions

10   necessary to receive input or recognize the chosen alternative. Typically, entry and choice cards cause one or more state variables to be set according to the information that is entered or the alternative that is chosen. A display card can also set one or more variables. A special form of the display card does not cause any visible display but can be used to set one or more variables.

A "digest" is an optional information structure that may be used to facilitate the transmission

15   and processing of multiple message entities including HDML decks. In particular, each message entity in a digest is processed in sequence according to entity type. In one embodiment, message entity types include HDML decks, images and alerts. One important use of the digest and the alert entity is discussed below.

The current state of the three basic functions, navigation, communication and interface, can

20   be expressed in terms of the deck and card in that deck that is currently displayed and one or more variables needed to process the card. By saving this information in persistent storage, remote device 11 can restore the current state at a future time. A cache of decks, a navigation history of hyperlink traversals and a history of user activity can also be used to improve performance, provide additional functions to the user, and provide additional facilities for use by system developers.

25   Handheld devices like telephones have severely limited facilities for entering information. The input facilities of these devices are often limited to the familiar twelve keys of a pushbutton telephone. One common method for entering text is to assign letters to various numeric keys according to normal telephone conventions. For example, the letters ABC are assigned to the "2" key and the letters DEF are assigned to the "3" key. The letters Q and Z could be assigned to the "0"

30   key, for example. According to this method, the letter A is entered by pressing the "2" key once and the letter B is entered by pressing the key twice. In preferred embodiments of remote device 11, a form of letter prediction is used to make text entry more efficient.

UWP002   - 7 -

This prediction can be based on the statistics of letter combinations. For example, after entering the letters T and H, it is much more likely that a user will enter the letter E than the letters D or F. Accordingly, after entering T and H, in response to a user pressing the "3" key, remote device 11 will present the letter E first rather than the letter D. The prediction can be based on a
5   table of probabilities for various three-letter combinations stored in storage 14.

Intermediate Computer

Computer 31, together with remote device 11, provides the functions of a conventional hypermedia client. In the embodiment discussed above, computer 31 receives information from remote device 11 according to the HDTP, translates the HDTP information into corresponding
10   HTTP information as necessary, and sends the result to server 51. Similarly, computer 31 receives information from server 51 according to the HTTP, translates the HTTP information into corresponding HDTP information as necessary, and sends the result to remote device 11. Preferably, HDTP information exchanged with remote device 11 is compiled from a textual form into a binary form that reduces the bandwidth requirements of the communication channel and
15   reduces the processing required by remote device 11 to parse and interpret the information. Alternatively or in addition, the information may be subjected to other types of data compression to reduce bandwidth requirements.

Basic Exchange of Messages

By using the UDP/IP, a session can be created more efficiently than is possible using the
20   more common TCP/IP. The exchange of information needed to create a session is similar to the exchange carried out for other types of requests. An exchange can be initiated by remote device 11 sending a request to computer 31. Subsequently, computer 31 returns a reply to the request and remote device 11 acknowledges receipt of the reply. The reply may either be expected results of the request or it may be an indication of some error encountered while attempting to service the request.
25   If remote device 11 does not receive a reply within some timeout interval, it will send the request to computer 31 again. Remote device 11 will send the request repeatedly until either it receives a reply message, or a standby or "HoldOn" message from computer 31. The length of the timeout interval can be user configurable or it can be established by information previously received from computer 31. Similarly, computer 31 will send the reply repeatedly until it receives the acknowledgement
30   from remote device 11.

For example, remote device 11 may initiate the creation of a session by sending a session-creation request to computer 31. The request includes any necessary authentication information, one

UWP002   - 8 -

or more session parameters, and information describing the device and version of software in use. Computer 31 receives the request, validates the authentication information, checks that the user is entitled to initiate a session, assigns an identifier to the new session, builds a message containing the session identifier and any information that computer 31 wishes to pass to remote device 11, and

5   sends the message to remote device 11. Preferably, this message also includes the URL of a "home page" associated with the device. Remote device 11 acknowledges receipt of the message and the session is established.

<center>Get Request .</center>

As another example, when a user traverses a hyperlink, remote device 11 consults its cache,

10   if any, and determines if the cache already has the requested hypermedia entity (HDTP deck). If it does and the deck in the cache is not out of date, remote device 11 can process the requested deck and no further action is required. If the requested deck is not available or is out of date, however, remote device 11 builds a message including a HDTP "Service Request" and the URL of the requested deck and sends the message to computer 31. According to the HDTP, the message also

15   includes a header with information that is unique to the request. Remote device 11 then waits for a reply from computer 31. The reply may be the requested deck or it may be an indication that an error occurred while attempting to service the request.

Computer 31 receives the request, checks its validity and attempts to establish a connection with the appropriate network server, say server 51. If the connection fails, remote device 11 is

20   notified. Otherwise, computer 31 builds a message that includes a HTTP "GET" method and the URL of the desired hypermedia entity. In one embodiment, the header of the message is constructed from "common" parameters that are common to all users, from "session" parameters that are unique to the session with remote device 11, and any "request" parameters that were passed in the header of the HDTP request. Preferably, any conflicts in the three sets of parameters are resolved in favor

25   of request parameters first, session parameters second, and common parameters last. Alternatively, the HTTP header may be constructed from just common parameters, just session parameters, just request parameters, or any combination of these parameters.

After constructing the HTTP get request, computer 31 sends it through the established connection to server 51. Server 51 attempts to service the HTTP "GET" request and sends the result

30   to computer 31 in a HTTP response. Computer 31 checks a result code contained in the header of the HTTP response. If the result code indicates an error occurred, computer 31 may take any of several possible actions explained below. If the result code indicates the request was serviced

UWP002   - 9 -

successfully, computer 31 builds an appropriate HDTP response containing the results of the get request and sends the HDTP response to remote device 11. Computer 31 may compress, encrypt or convert the result as desired. If server 51 does not respond with a complete result within a reasonable period of time, the connection is dropped and an error indication is returned to remote

5   device 11.

Remote device 11 acknowledges receipt of the HDTP response and displays and/or processes message entities included in the response. If computer 31 does not receive an acknowledgement within a reasonable period of time, it sends the HDTP response again. Computer 31 may repeat the transmission one or more times until an acknowledgment is received. If an

10   acknowledgement is not received after a desired number of attempts, computer 31 may discard the result and abandon the attempt to send it, save the result in storage 32 for a future attempt, or save a message for future transmission indicating the result was discarded.

Variations on the Get Request

Computer 31 may respond with error indications for a variety of circumstances. For

15   example, computer 31 may notify remote device 11 that the requested URL is for a scheme or protocol that is not supported, or that the requested URL designates a network server that cannot be resolved using the Domain Name Service (DNS).

HTTP result codes are numerical codes of the form XXX. If the result code in a HTTP response is 301 or 302, a "redirection error," it indicates the requested resource has been moved.

20   The new URL may be returned to remote device 11. Alternatively, computer 31 may respond to the redirection error by using the new URL to establish a connection with the new server, say server 52, construct a new HTTP get request and submit it to server 52. The response from server 52 and the new URL are returned to remote device 11.

If the result code in a HTTP response is 401, it indicates the user is not authorized access to

25   a particular "realm." Computer 31 may check storage 32 to determine if there is a user name and password for the realm that generated the error. If an appropriate user name and password are available, computer 31 can resubmit the request with the authorizing information. If a user name and password are not available, or if the resubmitted request results in a another unauthorized error, computer 31 may construct a HDTP deck with an entry card by which the user can enter the correct

30   user name and password for the realm generating the error.

Generally, client errors (4xx), server errors (5xx) and other types of errors may be handled by computer 31 returning a deck with one or more display cards explaining the nature of the error and what course of action the user may consider taking.

Additional Functions and Features

5   Remote device 11 can use a post request to send data to a server. In one embodiment, remote device 11 builds a HDTP "Post" request including the URL of the intended network server and a block of data. Computer 31 constructs and sends a corresponding HTTP "POST" method in a manner similar to that described above for the get request.   .

Although many client functions do not need to be implemented to realize the benefits of the present invention, some client functions are important in many applications. These functions include creating and managing sessions with a hypermedia server, handling a variety of error conditions like those discussed above, authenticating a user to the server, establishing a private session and managing user certificates and encryption keys, managing a first level cache, handling redirection errors and validating hypermedia content.

15   The operational characteristics of client 1 are affected by parameters and other information stored in storage 32. Examples of operational characteristics include a list of authorized subscribers or users, resources that are available to each respective user, and timeout values for respective remote devices 11 and computer 31. In preferred embodiments, these parameters and information are maintained by a facility on computer 31 that operates as a network server, perhaps a HTTP

20   server. In this manner, the operational characteristics of client 1 can be administered locally or remotely by an authorized network client.

The headers for each HTTP request can include a parameter that specifies what type of content for the response is acceptable. As mentioned above, in some embodiments this parameter can be obtained from common parameters, session parameters or request parameters. Computer 31

25   can check the content of any reply from a server and determine whether the content is acceptable to remote device 11. If the content is not acceptable, computer 31 may notify remote device 11 of the error. For example, content types such as applets, movies and certain types of images may not be acceptable. Alternatively, when possible, computer 31 may convert the content into a form that is acceptable. For example, computer 31 may be able to convert one type of image, say JPEG, into an

30   acceptable form, say GIF.

Remote Device Initialization

An HDTP session can have a very long life, extending beyond the time remote device 11 is turned off. A session can also be interrupted by some other function remote device 11 is required to perform such as, for example, a wireless telephone initiating or receiving a voice telephone call.

5   Remote device 11 can resume a suspended session with computer 31 by preserving session-related information in persistent storage. This information includes the session identifier and any information required to identify computer 31. In addition, if encryption has been in use for this session, the saved information can include encryption keys, flags indicating the type of encryption method, block-chaining values, or other information needed to resume encryption. Alternatively,

10   encryption can be initiated anew as is done at time of session creation.

In an embodiment allowing resumption of a suspended session, remote device 11, when turned on, determines whether a session was suspended. If it was, remote device 11 sends a request to computer 31 using the session-related information stored in persistent storage. Computer 31 receives the request, validates the session and determines whether the session has expired. If the

15   session is valid, computer 31 services the request. If the session is not valid, computer 31 returns an error indication to remote device 11 which can then initiate a request to create a new session.

At the time of session creation, remote device 11 establishes session parameters used to construct HDTP headers. These parameters can be set according to values provided by remote device 11 and/or computer 31. These parameters may include HTTP related values such as Accept,

20   Accept-Charset and Accept-Language, and they may include values not related to the HTTP such as a timeout interval between sending retries, maximum packet length remote device 11 can accept and the encryption algorithm to use. Preferably, in subsequent exchanges between remote device 11 and computer 31 after these parameters are established, headers include only parameters that the receiving device does not already know.

25   Preferably, headers are formed in a manner that simplifies the processing required to parse and interpret the embedded information. Headers for the HDTP contain pairs of ASCII text strings, each string terminated by a null or zero-valued byte. The first string in each pair specifies a key or parameter name and the second string provides the key's value. Most headers contain a single byte that specifies the header type. Frequently used keys and values can be encoded into single bytes

30   having a value from 128 to 255.

In preferred embodiments, remote device 11 also checks during initialization for anything relevant that is pending in computer 31. For example, responses or message entities may have queued up in computer 31 while the session with remote device 11 was suspended.

Most practical implementations of remote device 11 do not maintain accurate time. In
5   preferred embodiments, during initialization or at any time thereafter, remote device 11 can obtain the current time from computer 31 by a request.

Reducing Perceived Latency

Various network services including electronic mail have the ability to notify a user when some asynchronous or unsolicited event has occurred or is about to occur. In this context, the term
10   "unsolicited" refers to an event that is not a direct result of some user request. A notification of the arrival of one or more pieces of electronic mail or data from other users or from services providing periodic stock price quotations are examples of unsolicited events. In response to the notification, a user can request delivery of the mail, the data, or some other message from the network server that provided the notification. Referring to the Figure, the network service providing the notification
15   may reside on server 51, for example, or it may reside on computer 31.

The time required to obtain the unsolicited information is at least as great as the total time it takes to convey the request to the server and to convey the reply from the server to the user's terminal or workstation. In conventional systems, the communication time is usually not a factor; however, as mentioned above, signal propagation time between remote device 11 and computer 31
20   can be significant in systems where the communication path has a low bandwidth. For example, data communication via wireless telephones is sometimes restricted to as little as a few hundred bits per sec.

Significantly, the primary source of user dissatisfaction in such applications is how much time is spent waiting for return of the reply, not when the reply actually arrives. For example, if
25   electronic mail were to arrive in a user mail box at 3:00 p.m., most users would not be concerned whether the mail reached their terminal at 3:02 p.m. or 3:05 p.m. What is of concern, however, is the perceived delay, the time spent waiting for requested information to arrive. The perceived delay can be greatly reduced by delivering at least a portion of the unsolicited information to remote device 11 before notifying the user.

30   In one embodiment, a network service receives messages representing one or more instances of unsolicited information for remote device 11. That network service causes computer 31 to generate one or more message entities representing at least a portion of the unsolicited information

and to send those message entities to remote device 11. Preferably, the message entities are assembled into one or more HDML decks that are contained in a digest. Also included in the digest is a message entity that specifies an operation, or type of operation, that remote device 11 is to perform to notify the user. The notification may be a visual presentation on screen 12, or it may be an aural or tactile presentation by some other suitable transducer. The notification may also be accompanied by text, presented on display 12, explaining the nature of the notification. The message entity specifying the notification can also contain the URL of any related hypermedia entity such as the fulltext of electronic mail, embedded files, an "entry" card for preparing an immediate reply, etc.

In electronic mail applications, the digest preferably includes cards representing a portion of each piece of mail, say the first 100 characters, one or more cards containing a list of all mail in the user's mail box, and a card with one or more URLs that causes the network service to deliver the text of one or more messages. Remote device 11 should process the cards, decks and other message entities included in the digest in strict order. Significantly, the notification or alert message entity should be processed after the preceding message entities have been stored in storage 14 and are available for display or other processing.

In practice, notification or alert message entities are often used with "prefetch notifications." Prefetch notifications specify a deck or digest which an application executing in remote device 11 requests and stores in storage 14 before notifying a user.

In preferred embodiments of remote device 11, notification or alert message entities are stored in persistent storage and a card is provided that displays a list of alert message entities that have been sent to remote device 11. An indication of whether a user has acted on a notification is stored and displayed for each respective alert message entity. When a new alert message entity arrives, remote device 11 determines if a duplicate entity is already stored. If a duplicate entity is stored, the older entity is deleted and the new entity is stored, clearing any indication that the user has acted on the corresponding notification.

Saving Lists of Bookmarks

In devices like wireless telephones, there is usually insufficient storage to save lists of frequently used hypermedia links, e.g., URLs. This limitation reduces the usefulness of these devices because hypermedia links are usually difficult to remember and especially difficult to enter into the device. Software products for conventional computers provide facilities to save lists of these links. Two popular products refer to these stored links as "bookmarks" and "favorites."

UWP002   - 14 -

This limitation is overcome by storing designated hypermedia links or bookmarks on a network server, referred to herein as a bookmark server. In one embodiment, the URL of this server is sent to remote device 11 during initialization of the device.

5   In response to the activation of a particular button 13, remote device 11 uses the bookmark server URL to construct a request to save the bookmark of the deck containing the currently displayed card. This may be done by appending the bookmark server URL with an argument specifying the deck bookmark and submitting the request to computer 31. Computer 31 passes the request to the bookmark server. The bookmark server services the request by saving the bookmark specified in the argument in a list uniquely associated with remote device 11. In addition, an entry

10   card can be used to prompt the user for a name or description of the bookmark. The name and bookmark URL are sent to the bookmark server which saves the bookmark and accompanying name in the list. Preferably, the bookmark server can also store one or more state variables used by remote device 11 to display or process the associated deck. For example, a state variable may be used to save information that a user entered through an entry card. These state variables can be

15   conveyed to the bookmark server by additional arguments appended to the server URL.

In preferred embodiments, decks and specified cards within decks may contain indications that they cannot be bookmarked. If a user attempts to save a bookmark for such a card or for any card with such a deck, remote device 11 is caused to display an appropriate message informing the user that the current card cannot be marked.

20   Remote device 11 can request all or part of the stored list by sending an appropriate request to the bookmark server. In one embodiment, the request comprises the URL of the bookmark server appended with an argument specifying the first entry in the list to send. For example, an initial request would specify the first entry in the list. In reply, the bookmark server would build a response representing entries one through N and a value referencing entry number N+1. A

25   subsequent retrieval request from remote device 11 would include the URL of the bookmark server appended with an argument specifying the N+1 entry. By continuing in this manner, the user is able to retrieve and display all entries in the stored list of bookmarks.

The deck and cards in the reply received from the bookmark server can also contain methods for modifying or deleting bookmarks in the stored list. A request to modify a bookmark

30   can be made by appending the bookmark server URL with arguments specifying a change to the selected bookmark and the desired change. Similarly, a request to delete a bookmark can be made

by appending the bookmark server URL with arguments specifying a deletion of the selected bookmark.

By implementing the bookmark server as a standard HTTP server, the bookmark list for a user can be accessed and maintained by any standard HTTP client. This feature allows a user to

5   setup and maintain the list more easily using a conventional computer.

<div align="center">

Annex and Incorporated Documents

</div>

Documents in an Annex to this main disclosure, computer listings in the microfiche appendix, and documents incorporated herein by reference, include specifications, proposals, specific implementations and features of particular products that describe and embody various

10   aspects of the present invention. Terms such as "required," "must," "significant," "necessary," "minimum" and "maximum" refer to particular embodiments disclosed therein and do not represent limitations on the scope of the present invention. Because these documents describe several versions of specific products, specifications and proposals, some features and terminology may differ among the several documents and this main disclosure. Not all features described therein are

15   required to practice the present invention; the various features may be used in essentially any combination. These documents describe some features that are either omitted or are not discussed in as much detail in this main disclosure. To this extent, these documents augment the main disclosure. To the extent that these documents disclose or suggest limitations that are not described in the main disclosure, those inconsistencies are to be resolved in favor of the main disclosure.

CLAIMS

1. A system comprising a remote device coupled to a directory server, wherein said remote device is remotely located with respect to said directory server and comprises first

5   storage, a display and a button, and executes a first program that causes said remote device

to receive a unit of information from a hypermedia network, said unit of information having an identifier, and to present on said display a representation of said unit of information,

to receive an input signal in response to said button being activated and, in response, to send an add request to said directory server that conveys said identifier,

10   and wherein said directory server comprises second storage that stores a directory associated with said remote device and executes a second program that causes said directory server to receive said add request and, in response, to add an entry to said directory representing said identifier.

15   2. A system according to claim 1 wherein said first program causes said remote device to send a retrieve request to said directory server, wherein said second program causes said directory server

to receive said retrieve request and, in response, to retrieve directory information representing one or more entries stored in said directory, and

20   to send one or more messages to said remote device representing said directory information,

and wherein said first program causes said remote device to receive said one or more messages, to store a representation of said messages in said first storage, and to present on said display a representation of said one or more messages.

25

3. A system according to claim 1 wherein said remote device is a wireless telephone.

4. A system according to claim 1 wherein said remote device is a handheld device.

30   5. A system according to claim 4 wherein said remote device is a telephone.

UWP002

6. A system according to claim 1 wherein said directory server receives requests and sends replies in a manner that substantially conforms to Hypertext Transfer Protocol.

7. A system according to claim 6 wherein said remote device sends said add request and said retrieve request via a device that translates said requests into messages conforming to the Hypertext Transfer Protocol.

8. A system according to claim 4 wherein each respective directory entry includes an identifier for a respective unit of information, a description of said respective unit information, and one or more variables affecting operation of said first program.

9. A system according to claim 1 wherein each respective directory entry includes an identifier for a respective unit of information, a description of said respective unit information, and one or more variables affecting operation of said first program.

10. A method for providing facilities to a remote device coupled to a directory server, wherein said remote device is remotely located with respect to said directory server and comprises first storage, a display and a button, and wherein said directory server comprises second storage that stores a directory associated with said remote device, said method comprises performing in said remote device:

     receiving a unit of information from a hypermedia network, said unit of information having an identifier, and presenting on said display a representation of said unit of information,

     receiving an input signal in response to said button being activated and, in response, sending an add request to said directory server that conveys said identifier, and said method comprises performing in said directory server:

     receiving said add request and, in response, adding an entry to said directory representing said identifier.

11. A method according to claim 10 that comprises performing in said remote device:
     sending a retrieve request to said directory server,

UWP002

receiving one or more messages from said directory server,

storing a representation of said messages in said first storage, and

presenting on said display a representation of said one or more messages,

and wherein said method comprises performing in said directory server:

5   receiving said retrieve request and, in response, retrieving directory information

representing one or more entries stored in said directory, and

sending said one or more messages to said remote device representing said

directory information.

10   12. A method according to claim 10 wherein said remote device is a wireless telephone.

13. A method according to claim 10 wherein said remote device is a handheld device.

14. A metod according to claim 13 wherein said remote device is a telephone.

15.

15. A method according to claim 10 wherein said directory server receives requests and

sends replies in a manner that substantially conforms to Hypertext Transfer Protocol.

16. A method according to claim 15 wherein said remote device sends said add request

20   and said retrieve request via a device that translates said requests into messages conforming to
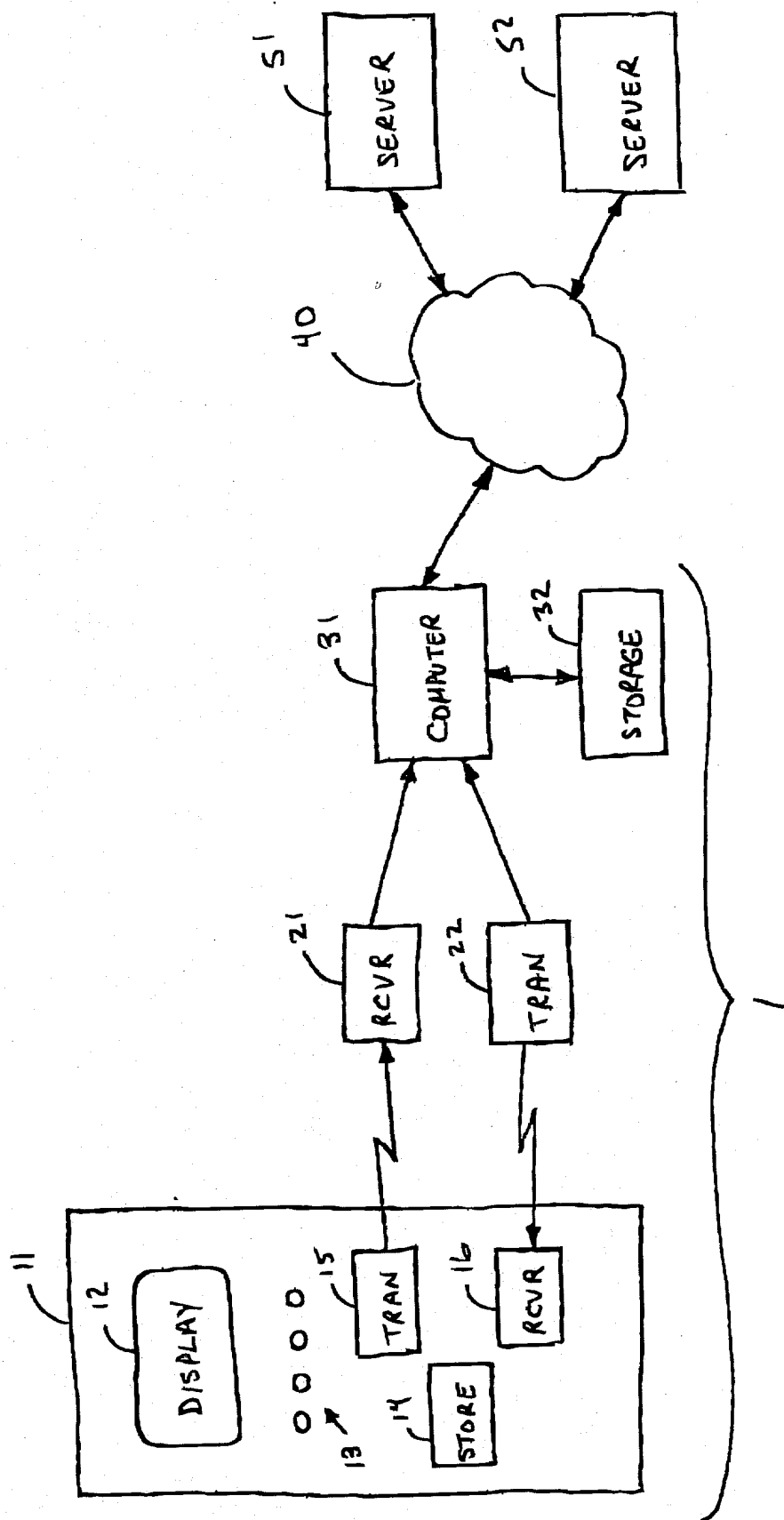
the Hypertext Transfer Protocol.

17. A method according to claim 13 wherein each respective directory entry includes an

identifier for a respective unit of information, a description of said respective unit information,

25   and one or more variables affecting operation of said first program.

18. A method according to claim 10 wherein each respective directory entry includes an

identifier for a respective unit of information, a description of said respective unit information,

and one or more variables affecting operation of said first program.

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UWP002

ABSTRACT OF THE DISCLOSURE

Access to hypermedia servers connected to networks such as the Internet can be provided through mobile devices such as wireless telephones. Hypermedia links such as Uniform Resource Locators (URL) are used to identify and control access to resources on the network. These links are

5   usually very long, are difficult to remember, and are difficult to enter into many mobile devices. These difficulties could be overcome by storing lists of frequently used links or "bookmarks" in the mobile device but limited memory in the device generally prevents this. This limitation is overcome by storing designated hypermedia links on a bookmark server. In one embodiment, the URL of the bookmark server is sent to the mobile device during initialization of the device. By allowing a user

10   can to save, retrieve and maintain lists of frequently used links on the bookmark server, access to favorite resources on a network is greatly simplified.

UWP002

DECLARATION OF JOINT INVENTORS

As a below named inventor, I hereby declare that:

My post office address, residence address and country of citizenship as stated below next to my name are true and correct;
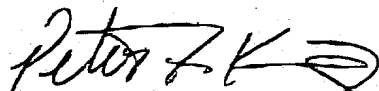
I believe I am an original, first and joint inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled "Providing a Directory of Frequently Used Hyperlinks on a Remote Server," described in the patent application filed herewith, which claims the benefit of priority under 35 U.S.C. § 119(e) of U.S. provisional patent application Serial No. 60/052,394 filed July 11, 1997;

I have reviewed and understand the contents of the above identified application, including the description, claims and drawings, and including any amendments specifically referred to herein; and

I acknowledge the duty under Title 37, Code of Federal Regulations § 1.56 to disclose all information, including information which occurred between the filing of the prior U.S. patent application and the national filing date of this continuing application, known to be material to the examination of the patent application mentioned above.

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Inventor: Peter F. King
Post Office: 390 Bridge Parkway
                Redwood Shores, California 94065
Residence: Half Moon Bay, California
Citizenship: U.S.A.

_____   _____
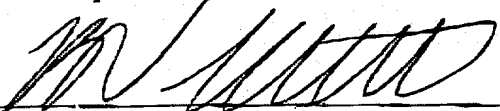Signature (exactly as typed above)   Dec. 19, 1997
                                                          Date

Inventor: Bruce V. Schwartz
Post Office: 390 Bridge Parkway
                Redwood Shores, California 94065
Residence: San Mateo, California
Citizenship: U.S.A.

_____   _____
Signature (exactly as typed above)   12/19/97
                                                          Date

Docket: UWP002

ASSIGNMENT

Peter F.King, a resident of the City of Half Moon Bay, County of San Mateo, State of California, herein referred to as ASSIGNOR, is a joint inventor of a new invention entitled "Providing a Directory of Frequently Used Hyperlinks on a Remote Server" by Peter F.King and Bruce V. Schwartz, for which he has executed a patent application on __12-19-97__.

UNWIRED PLANET, INC., a corporation of the State of Delaware, having a place of business at 390 Bridge Parkway, Redwood Shores, State of California, hereinafter referred to as ASSIGNEE, is desirous of acquiring the entire right, title and interest in and to said application and said invention, in and to any and all improvements relating to said invention, and in and to Patent thereon, when granted in the United States and all foreign countries.

In consideration of the employment of ASSIGNOR by ASSIGNEE and for other good and valuable consideration:

1.   ASSIGNOR sells, assigns, transfers and conveys unto ASSIGNEE, the entire right, title and interest:

(a) in and to said invention, improvements, application, and each and every additional application filed anywhere in the world, whether or not the country of filing is a member of the International Union for the Protection of Industrial Property (The Paris Convention), which additional application is a division, substitution, continuation or continuation-in-part of or is based on said application or which additional application relates to said invention and improvements;

(b)   all priority rights associated with the filing of each and every such application, for each country of The Paris Convention, and

(c) in and to each and every Patent on said invention and improvements that may be granted by any country, including each and every Patent that may be granted on any of the applications referred to in sub-section (a), and in and to each and every reissue, re-examination or extension of each and every such Patent.

2.   ASSIGNOR warrants, covenants and represents the fact that he has not heretofore granted any license, right or privilege in respect to said invention or said application or in any other way encumbered the same, and that he has the full right to sell, assign, transfer and convey, free of all licenses and encumbrances, the entire interest hereby assigned.

3.   ASSIGNOR covenants that at the request and expense of ASSIGNEE he will promptly execute all papers necessary or desirable to perfect ownership of said invention, applications and said Patent to ASSIGNEE, and execute all oaths, declarations and other papers necessary or desirable for prosecuting said applications and Patent, for use in interference proceedings involving said invention, applications and Patent, for use in opposition proceedings involving said invention, applications and Patent, for refiling said

applications, for filing of divisional, substitution, continuation or continuation-in-part applications deemed necessary or desirable by ASSIGNEE. for reissuance or re-examination of said Patent. or for the filing in foreign countries of applications for Patent counterpart to or based on said application or to an application which is a division, substitution, continuation or continuation-in-part of said application or which application relates to said invention and improvements. ASSIGNOR further covenants and agrees that at the expense and request of ASSIGNEE, he will promptly assist ASSIGNEE in interference and opposition proceedings involving said invention, applications and Patent, and in litigation involving said invention, applications and Patent, and will assist in the ascertainment of facts and the production of evidence relating to said invention, applications and Patent.

4.   The terms, covenants and provisions of this assignment shall inure to the benefit of ASSIGNEE, its successors, assigns and other legal representatives, and shall be binding upon ASSIGNOR, his heirs, legal representatives and assigns.

_____   _____
            ASSIGNOR   Dec. 19 , 1997
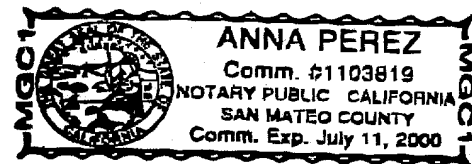   Date

STATE OF CALIFORNIA   )
COUNTY OF SAN MATEO   )

On this ___19th___ day of ___December___ 1997, before me, the undersigned notary public, personally appeared the above-named Assignor, personally known to me or proved to me on the basis of satisfactory evidence to be the person whose name is subscribed to this Assignment and acknowledged to me that he executed the same in his authorized capacity, and that by his signature on this Assignment the Assignor, or the entity upon behalf of which the Assignor acted, executed this Assignment.

_____   SEAL
        Notary Public

ANNA PEREZ
Comm. #1103819
NOTARY PUBLIC CALIFORNIA
SAN MATEO COUNTY
Comm. Exp. July 11, 2000

Assignment: UWP002   - 2 -

RECORDATION FORM COVER SHEET
PATENTS ONLY

To the Honorable Commissioner of Patents and Trademarks. Please record the attached original documents or copy thereof.

1. Name of conveying party:	2. Name and address of receiving party(ies):
Bruce V. Schwartz	Unwired Planet, Inc.
Additional names attached [ ] yes [X] no	390 Bridge Parkway
	Redwood Shores, California 94065

3. Nature of Conveyance:

[X] Assignment   [ ] Change of Name

[ ] Other:

Execution Date: 12/19/97

Additional name(s) & address(es) [ ] yes [X] No

4. Application Number or Patent Number

If this document is being filed together with a new application, the execution date of the application is: 12-19-97
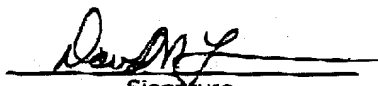
Application Number   Patent Number

[ ] If checked, additional numbers are attached

5. Name and address of party to whom correspondence concerning document should be mailed:	6. Total Number of applications and patents involved: 1
David N. Lathrop, Esquire	7. Total fee (37 CFR 3.41):.............$ 40.00
THOMAS A. GALLAGHER,	[X] Enclosed
A Professional Corporation	[ ] Charge to deposit account (copy attached)
601 California Street, Suite 1111	
San Francisco, CA 94108-2805	8. Deposit account number: 07-0137

DO NOT USE THIS SPACE

9. Statement and Signature:

To the best of my knowledge and belief, the foregoing information is true and correct and any attached copy is a true copy of the original document.

David N. Lathrop	_[signature]_	12/22/97
Name	Signature	Date

Total # pages including cover sheet: 3

Mail documents to be recorded with required cover sheet information to:

Commissioner of Patents and Trademarks
Box Assignment
Washington, D.C. 20231

REV 8/95   Atty. File No.: ___UWP002___

ASSIGNMENT

Bruce V. Schwartz, a resident of the City of San Mateo, County of San Mateo, State of California, herein referred to as ASSIGNOR, is a joint inventor of a new invention entitled "Providing a Directory of Frequently Used Hyperlinks on a Remote Server" by Peter F.King and Bruce V. Schwartz, for which he has executed a patent application on ___12/19/97___.

UNWIRED PLANET, INC., a corporation of the State of Delaware, having a place of business at 390 Bridge Parkway, Redwood Shores, State of California, hereinafter referred to as ASSIGNEE, is desirous of acquiring the entire right, title and interest in and to said application and said invention, in and to any and all improvements relating to said invention, and in and to Patent thereon, when granted in the United States and all foreign countries.

In consideration of the employment of ASSIGNOR by ASSIGNEE and for other good and valuable consideration:
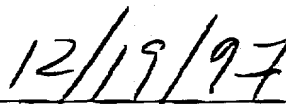
    1.   ASSIGNOR sells, assigns, transfers and conveys unto ASSIGNEE, the entire right, title and interest:

    (a) in and to said invention, improvements, application, and each and every additional application filed anywhere in the world, whether or not the country of filing is a member of the International Union for the Protection of Industrial Property (The Paris Convention), which additional application is a division, substitution, continuation or continuation-in-part of or is based on said application or which additional application relates to said invention and improvements;

    (b)   all priority rights associated with the filing of each and every such application, for each country of The Paris Convention, and

    (c) in and to each and every Patent on said invention and improvements that may be granted by any country, including each and every Patent that may be granted on any of the applications referred to in sub-section (a), and in and to each and every reissue, re-examination or extension of each and every such Patent.

    2.   ASSIGNOR warrants, covenants and represents the fact that he has not heretofore granted any license, right or privilege in respect to said invention or said application or in any other way encumbered the same, and that he has the full right to sell, assign, transfer and convey, free of all licenses and encumbrances, the entire interest hereby assigned.

    3.   ASSIGNOR covenants that at the request and expense of ASSIGNEE he will promptly execute all papers necessary or desirable to perfect ownership of said invention, applications and said Patent to ASSIGNEE, and execute all oaths, declarations and other papers necessary or desirable for prosecuting said applications and Patent, for use in interference proceedings involving said invention, applications and Patent, for use in opposition proceedings involving said invention, applications and Patent, for refiling said

applications, for filing of divisional, substitution, continuation or continuation-in-part applications deemed necessary or desirable by ASSIGNEE, for reissuance or re-examination of said Patent, or for the filing in foreign countries of applications for Patent counterpart to or based on said application or to an application which is a division, substitution, continuation or continuation-in-part of said application or which application relates to said invention and improvements. ASSIGNOR further covenants and agrees that at the expense and request of ASSIGNEE, he will promptly assist ASSIGNEE in interference and opposition proceedings involving said invention, applications and Patent, and in litigation involving said invention, applications and Patent, and will assist in the ascertainment of facts and the production of evidence relating to said invention, applications and Patent.

4.   The terms, covenants and provisions of this assignment shall inure to the benefit of ASSIGNEE, its successors, assigns and other legal representatives, and shall be binding upon ASSIGNOR, his heirs, legal representatives and assigns.
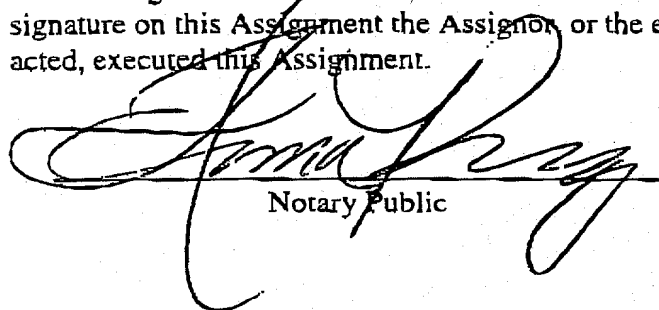
_____   _12/19/97_____
              ASSIGNOR   Date

STATE OF CALIFORNIA   )
COUNTY OF SAN MATEO   )

On this __19th__ day of __December__ 1997, before me, the undersigned notary public, personally appeared the above-named Assignor, personally known to me or proved to me on the basis of satisfactory evidence to be the person whose name is subscribed to this Assignment and acknowledged to me that he executed the same in his authorized capacity; and that by his signature on this Assignment the Assignor, or the entity upon behalf of which the Assignor acted, executed this Assignment.

_____   SEAL
           Notary Public

ANNA PEREZ
Comm. #1103819
NOTARY PUBLIC · CALIFORNIA
SAN MATEO COUNTY
Comm. Exp. July 11, 2000

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventors: Peter F. King
                Bruce V. Schwartz

Serial No.:   08/996,379

Filing Date: December 22, 1997

Patent No: 5,895,471

Issue Date: April 20, 1999

Title: Providing a Directory of
                Frequently Used Hyperlinks on
                a Remote Server

                                        March 28, 2000
                                        San Francisco, California

Commissioner of Patents
Washington, DC 20231

Attention: **Ms. Jennifer Hayes**
             Office of Petitions

TRANSMITTAL OF POWER OF ATTORNEY

Sir:

        The undersigned attorney of record hereby submits a supplemantal Power of Attorney for the application and patent mentioned above.

Respectfully submitted,

David N. Lathrop
Reg. No. 34,655
601 California St., Suite 1111
San Francisco, CA 94108-2805
Telephone: (415) 989-8080
Facsimile: (415) 989-0910

Att.   Power of Attorney

Docket: UWP002

POWER OF ATTORNEY

I have power of attorney to appoint other attorneys to prosecute and to transact all business in the United States Patent and Trademark Office in connection with U.S. patent application Serial No. 08/996,379 filed December 22, 1997, now U.S. patent 5,895,471.

I appoint the following as principal attorneys and agents with full power to transact all business in the United States Patent and Trademark Office in connection with this application and patent:

> Alan D. Minsk (Reg. No. 35,956)
> Joe Zheng (Reg. No. 39,450)

Please send all correspondence to:
> Elaine Kramer-Adams
> Patent Administrator
> Phone.com, Inc.
> 800 Chesapeake Drive
> Redwood City, California 94063

_____   _March 28, 2000_
David N. Lathrop   Date
Attorney of Record

Docket: UWP002

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s):	Peter F. King and Bruce V. Schwartz
Title:	Providing a Directory of Frequently Used Hyperlinks on a Remote Server
Serial No.:	N/A
Filing Date:	2/24/1999
Examiner:	N/A
Group Art Unit:	N/A
Docket No,:	UWP002/1007Ct

November 2, 1999

Assistant Commissioner for Patents

Box Petition

Washington, DC 20231

Petition for Correction of Transmittal

Dear Sir:

The undersigned requests the earlier filed transmittal entitled "CONTINUED PROSECUTION APPLICATION (CPA) REQUEST TRANSMITTAL" be replaced by the enclosed transmittal "UTILITY PATENT APPLICATION TRANSMITTAL". The undersigned further requests a filing receipt be issued.

A copy of the earlier filed application package is enclosed herein to support the filing date.

The PTO is authorized to charge our deposit account No. 50-0516 any charges that may be due. Please telephone the undersigned at (408)777-9887, if there are any questions.

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to "Commissioner of Patents and Trademarks, Washington, DC 20231", on Nov __2__, 1999.

Name:__Kramer-Adams Elaine__

Signature

Respectfully submitted,

Joe Zheng
Reg. No.: 39,450

UP,Patent Office
800 Chesapeake Drive
Redwood City, CA 94063

Please type a plus sign (+) inside this box [+]

UTILITY PATENT APPLICATION TRANSMITTAL
(Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No.   1007Ct   **Total Pages:** 21

First Named Inventor or Application Identifier King et al.

Express Mail Label No. EJ 327832297US

ADDRESS TO: **Assistant Commissioner for Patents**
Box Patent Application
Washington, D. C. 20231

APPLICATION ELEMENTS
See MPEP chapter 600 concerning utility patent application contents.

1. ____ **Fee Transmittal Form**
(Submit an original, and a duplicate for fee processing)

2. __x__ **Specification**   (Total Pages ___20___)
(preferred arrangement set forth below)
- Descriptive Title of the Invention
- Cross References to Related Applications
- Statement Regarding Fed sponsored R & D
- Reference to Microfiche Appendix
- Background of the Invention
- Brief Summary of the Invention
- Brief Description of the Drawings (if filed)
- Detailed Description
- Claims
- Abstract of the Disclosure

3. __X__ **Drawings(s) (35 USC 113)**   (Total Sheets __1__)

4. ____ **Oath or Declaration**   (Total Pages __)

   a. ____ Newly Executed (Original or Copy)

   b. ____ Copy from a Prior Application (37 CFR 1.63(d))
(for Continuation/Divisional with Box 17 completed) **(Note Box 5 below)**

   i. ____ DELETIONS OF INVENTOR(S) Signed statement attached deleting inventor(s) named in the prior application, see 37 CFR 1.63(d)(2) and 1.33(b).

5. __X__ **Incorporation By Reference (useable if Box 4b is checked)**
The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied under Box 4b, is considered as being part of the disclosure of the accompanying application and is hereby incorporated by reference therein.

6. __X__ **Microfiche Computer Program** (Appendix)

7. ____ Nucleotide and/or Amino Acid Sequence Submission
(if applicable, all necessary)
   a. ____ Computer Readable Copy
   b. ____ Paper Copy (identical to computer copy)
   c. ____ Statement verifying identity of above copies

ACCOMPANYING APPLICATION PARTS

8. ____ Assignment Papers (cover sheet & document(s))

9.   __   a.   37 CFR 3.73(b) Statement (where there is an assignee)

        __   b.   Power of Attorney

10.   __   English Translation Document (if applicable)

11.   __   a.   Information Disclosure Statement (IDS)/PTO-1449

        __   b.   Copies of IDS Citations

12.   X   Preliminary Amendment·

13.   X   Return Receipt Postcard (MPEP 503) (Should be specifically itemized)

14.   __   a.   Small Entity Statement(s)

        __   b.   Statement filed in prior application, Status still proper and desired

15.   __   Certified Copy of Priority Document(s) (if foreign priority is claimed)

16.   X   Other: Check for $847.00.

                          Change of Correspondence Address

                          _____

                          _____

                          _____

---

17.   If a CONTINUING APPLICATION, check appropriate box and supply the requisite information:

        X   Continuation   ____ Divisional   ____ Continuation-in-part (CIP)

                of prior application No: 08/996,379 _____

---

18.   **Correspondence Address**

____   Customer Number or Bar Code Label

                       or   (Insert Customer No. or Attach Bar Code Label here)

  X   Correspondence Address Below

NAME   Alan D. Minsk _____

          Phone.com, Inc. _____

ADDRESS   800 Chesapeake Drive _____

          _____

CITY Redwood City _____   STATE   CA _____   ZIP CODE 94063

Country   U.S.A. _____   TELEPHONE (650) 817-1610 ____   FAX (650) 817-1499 ____

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s):   Peter F. King and Bruce V. Schwartz
Title: Providing a Directory of Frequently Used Hyperlinks on a Remote Server
Serial No.:   N/A
Filing Date: Herewith
Examiner: N/A
Group Art Unit: N/A
Docket No,:   **UWP002/1007Ct**

February 24, 1999

Assistant Commissioner for Patents

Washington, DC 20231

Re: Change of Correspondence Address

Dear Sir:

This is to request the Correspondence Address of record be changed as follows:

>Joe Zheng
>UP.Patent Office
>800 Chesapeake Drive
>Redwood City, CA 94063

>Tel: (408)777-9887

Please send all correspondence to the new address.

Express Mail Label #: EJ327832297US
Date of Deposit:_____
I hereby certify that this paper or fee is being deposited with the United States Postal Service using "Express Mail Post Office To Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to "Assistant Commissioner for Patents, Washington, DC 20231."

Name _ELAINE KRAMER-ADAMS_

Signed _Elaine Kramer-Adams_

Dated this 24ᵗʰ day of February,

Joe Zheng
Reg. No.: 39,450

UP.Patent Office
800 Chesapeake Drive
Redwood City, CA 94063

-1-

Attorney Docket No.: 3399P087C   <u>Patent</u>

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application for:

    Peter F. King et al.

Serial No.: 09/533,556

Filing Date: February 24, 1999

For: PROVIDING A DIRECTORY OF
       FREQUENTLY USED HYPERLINKS
       ON A REMOTE SERVER

which is a continuation of:

Serial No.: 08/996,379

Filing Date: December 22, 1997

which issued as U.S. Patent No.: 5,895,471

Examiner: Not yet assigned

Group Art Unit: 2776

Assistant Commissioner for Patents
Washington, D.C. 20231

<u>POWER OF ATTORNEY BY ASSIGNEE AND REVOCATION OF PREVIOUS POWERS</u>

    <u>Openwave Systems Inc.</u> ("assignee"), a <u>   Delaware   </u>
      (Name of Assignee)   (State of Incorporation)

corporation having a place of business at <u>1400 Seaport Boulevard, Office #W4152,</u>

<u>Redwood City, CA 94063</u>, hereby states that to the best of assignee's knowledge
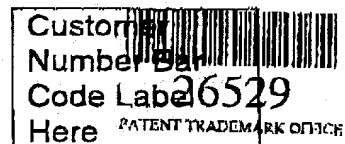   (Address)
and belief it is the assignee of the entire right, title, and interest in and to the

above-referenced patent application and represents that the undersigned is a

representative authorized and empowered to sign on behalf of the assignee.

    Upon information and belief, the assignment document that evidences the

placement of title in the assignee was recorded in the U.S. Patent and Trademark Office

on <u>December 22, 1997</u> at reel <u>8944</u> and frames <u>0189, 0190, 0191, 0174, 0175 and 0176</u>.

Pursuant to 37 C.F.R. §§ 1.36 and 3.71, the assignee hereby revokes all powers of

attorney previously given and appoints practitioners at

Customer Number <u>26529</u> →

as my/our attorney(s) or agent(s) to prosecute the

application identified above, and to transact all business

Customer
Number Bar
Code Label
Here   PATENT TRADEMARK OFFICE
26529

               (Rev. 03/05/01)

in the United States Patent and Trademark Office connected herewith.

Pursuant to 37 C.F.R. § 3.71, the assignee hereby states that prosecution of the above-referenced patent application is to be conducted to the exclusion of the inventor(s).

Send correspondence to the associated address to the above-mentioned Customer Number.

Assignee of Interest: Openwave Systems Inc.
                                        (Type or Print)

Dated: 2/7/2002   By: _____

Name: Alan D. Minsk, Esq.
                                (Type or Print)

Title: Director of Patents and Patent Counsel
                                (Type or Print)

Address of Assignee of Interest:

    1400 Seaport Boulevard, Office #W4152

    Redwood City, CA 94063

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR, & ZAFMAN LLP

Dated: 2/12/02   By _____
                                        JMB

Name: Jordan M. Becker
                                (Type)

Reg. No.: 39,602

12400 Wilshire Blvd.
Seventh Floor
Los Angeles, California 90025-1026
(408) 720-8300

- 2 -   (Rev. 03/05/01)

Attorney Docket No.: 3399P087C   Patent

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application for:

    Peter F. King et al.

Serial No.: 09/533,556

Filing Date: February 24, 1999

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     ON A REMOTE SERVER

which is a continuation of:

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Filing Date: December 22, 1997

which issued as U.S. Patent No.: 5,895,471

Examiner: Not yet assigned

Group Art Unit: 2776

Assistant Commissioner for Patents
Washington, D.C. 20231

CHANGE OF CORRESPONDENCE ADDRESS

Sir:

    Please address all future correspondence for the above-referenced patent

application to Jordan M. Becker, Blakely, Sokoloff, Taylor & Zafman LLP, 12400

Wilshire Boulevard, Seventh Floor, Los Angeles, CA 90025-1030.

                        Respectfully submitted,

                        BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP
                        ORIGINAL SIGNED BY
                        JMB

Dated: 12/10, 2001

                        Jordan M. Becker
                        Reg. No. 39,602

Customer No. 26529
12400 Wilshire Blvd.
Seventh Floor
Los Angeles, CA 90025-1030
(408) 720-8300